

VOL. IV, NO. 1144, PLS. 118

MARCH 21, 1912

THE  
NATIONAL GEOGRAPHIC MAGAZINE

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STUDIES OF  
MUIR GLACIER, ALASKA

MARY FARRING RICE



WASHINGTON

PUBLISHED BY THE NATIONAL GEOGRAPHIC SOCIETY

Price, \$1.00







FRONT OF HUBB GLACIER AND MOUNT BASS, LOOKING EASTWARD.

# THE NATIONAL GEOGRAPHIC MAGAZINE

## STUDIES OF MUIR GLACIER, ALASKA

BY HARRY FIELDING REID.

(Accepted for publication December 11, 1901.)

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## INTRODUCTION AND NARRATIVE.

A desire to see the Alaskan coast more thoroughly than is possible to ordinary tourists led to the formation of a party to spend the summer of 1898 encamped there.

The description of Muir glacier by Professor Wright\* turned our attention to that point. Its accessibility and the interest

\*The Ice Age in North America, 1880, chap. III.

awakened by its reported motion of 70 feet a day decided us to camp at its mouth and study the glacier and its neighborhood as thoroughly as time would permit. The first requisite was a reliable map of the region. None such existed, and we determined to devote much time to a survey and to make a map which would show with some accuracy the extent and form of the glacier and the positions of the mountains which surround it, and also serve to determine what changes may take place in the future. We also planned a careful measure of the motion of the ice, a determination of the magnetic elements, a regular meteorologic record, a study of the geology of the region, a collection of plants, and observations of all indications of change in the extent of the glacier, the amount of glacial erosion, etc.

The party consisted of Mr H. P. Cushing, who took charge of the meteorologic records, the geologic observations, and the collection of plants; Messrs H. McBride, R. L. Cassment, J. F. Morse, C. A. Adams, and the writer. It gives me pleasure to acknowledge that it would have been impossible to accomplish the work if it had not been for the cheerful and efficient aid which all my companions rendered.

Muir glacier seems to have been known only to the Indians until 1879, when it was visited by Professor John Muir and Reverend Mr Young; but they were prevented by bad weather from much exploration. In 1885 Professor G. F. Wright devoted a month to its study. We are indebted to him for a very interesting description. Until our visit, in 1888, these were the only attempts to obtain any accurate knowledge of the glacier. Glacier bay offers the luxury of exploration. Visited weekly during the summer by the steamers of the Pacific Coast Steamship company, the explorer can take with him everything necessary to his comfort, can renew supplies when necessary, can receive and despatch his mail, and still be in a region of which little is known—a region of great interest to the geologist and student of physical geography. It seems strange that it is not more thoroughly studied.

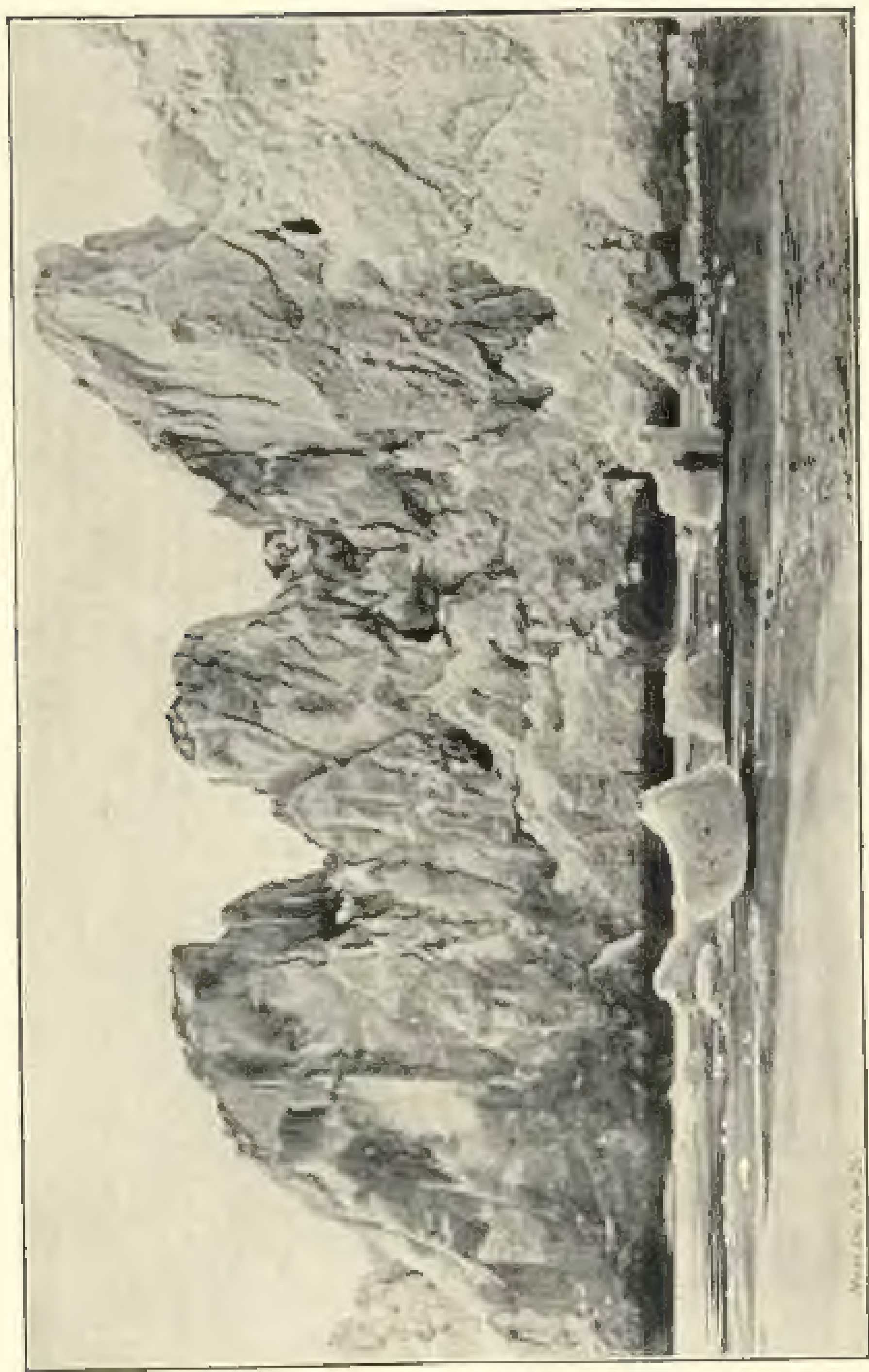
On July 1st the *George W. Elder* cast anchor in Muir inlet, not far from the glacier, and landed our instruments, tents, personal baggage, and provisions on the eastern shore. We found Professor Muir and Mr Locuis encamped there. They had come also to study the glacier, and added much to the pleasure of our stay. We immediately set to work to put up our tents, and

Before evening everything was in good shape. We brought boards from Juneau for flooring, tables, etc., which added materially to our comfort and convenience. A bookshelf held our small library of works on glaciers, logarithmic tables, etc. A gasoline stove enabled us to cook our meals with ease, and camp-stools permitted us to eat them in comfort. This was to be our base-camp, and, in honor of Professor Muir, we named it *Camp Muir*. Here we stayed until the middle of September, making various excursions of several days' duration to points too distant to be visited in one day, always, however, leaving two of our party at camp to make the meteorologic observations. We had with us a row-boat 19 feet long, provided with a sail, and during our stay we bought from the Indians a small dugout canoe which would carry three persons.

On one occasion, in company with Professor Muir, we rounded the western headland of Muir inlet and pushed a mile or two up Glacier bay. The water was so full of floating ice, in pieces large and small, that our progress was very slow, and we finally landed for the night, hoping to find clearer water the next day. In this we were disappointed, and therefore rowed back again and crossed the bay to the large island opposite Muir inlet. It was in this limestone island that Mr Cushing found the fossils which make it probable that these rocks are of Paleozoic age. Later in the evening we returned to camp Muir. On another occasion, following Professor Muir's example, we made sleds on which we packed our blankets, provisions, and instruments, and spent five days exploring and mapping the eastern part of the glacier. We ascended Tree mountain (2,700 feet) and Snow dome (3,300 feet), which, though of moderate elevation, commanded excellent views. Another time we visited the stations marked S and T on the accompanying map (plate 14), and ascended one of the peaks just to the westward. We also ascended Pyramid peak, approaching it by the valley of the Dying glacier. The weather unfortunately was misty, so that we added little to our knowledge of the mountains toward the west, except to see that they were numerous and did not seem to surround any very large valleys like that occupied by Muir glacier.

Shorter excursions were made on all clear days to points more easily accessible. Among these the most interesting were connected with the measure of the motion of the ice. To plant our flags where we wanted them required us to make a way among





ICE FJORDS AND ARE IN GOOD GLACIER

Mount. (1912)



the presence, with a few plants of *Lotus* etc. So we expect the  
to be a well known, somewhat common species for pro-  
gress. But the presence and what progress is should be taken to  
avoid the risk. We were always careful to get up and were pro-  
vided with some axes with several to cut logs in places where we  
were not allowed to cut. But we were not allowed to go deep  
into the mountains, or crossing the mountains at all, and for this  
reason we had to be careful. The usual method of progress  
of progress. The progress, however, that had a certain the  
method.

When at Port and Harbor in Egypt, and we reached Wallase, York, go with us to help in range work. At the end of the season, by going to work too early, and if it is too late, we will not be able to go back to Port and Harbor. Along the shore, look for a valley to I will not go. When we go out, we will get the sheep and go to the beach.

[illegible]

† 年 47 歲 4 月， 6 月 11 日 4 時 17 分。

The south-eastern extremity of Alaska consists almost entirely of a narrow peninsula, not extending as a space nearly to the headland and city of the long and narrow inlet now so called. The islands, bays, and straits are closely packed together, and the waterways, which form the straits and narrow, and which form a few straight channels. The islands are mountainous and, from the high all-riding low level of the places. Linear slopes are found everywhere, and the spaces. The rugged scenery of Alaska, as far as the coast was concerned, was first described by John Kotzebue and others, who, in 1807, were not only as supplied by the most accurate information of the state of the coast. In 1808, the first voyage to the coast was made by the U. S. S. "Enterprise" and the "Thetis" survey vessel in the direction of Assistant Paymaster John L. Alden, and the long has passed from 1881 to the present time, by means of which the survey made in the sea is steady, and results in the

of which one of the results of other data making known the two important channels and waterways with ample room for

South-east of the Alaska Peninsula, looking in and out the straits become larger and the waterways wider. These sound and key straits form the north-western boundary of the archipelago. From the northern coast of the Lynn Canal and Tachoo Bay extend toward the south and north-west forming a distance of about two per cent. The great Fairweather group of mountains occupies the western part of the peninsula between the coast of Alaska and the Pacific. The eastern part is occupied by another and much lower range, whose peaks rise about a 100 or 1500 feet above the sea. Their most easterly slopes are gradual and are covered with large glaciers, some of which reach the water and

which have been regarded as the Fairway. Between these two ranges there seems to be a deep valley, which divides the eastern slope of the Fairweather group. The valley is filled by a long narrow glacier descending into Tachoo or Tachoo Bay. Little was known of the peninsula between the Fairway and Lynn Canal, but it is now known from the fact that the eastern part, except that it is entirely made up of glacial basins of mountains, whose peaks are

about 1000 feet

North-west of the coast of Alaska the character of the coast of Alaska is very different; the coast line becomes irregular, without enclosing large bays or harbors, but is composed of great headlands rising gradually from the water's edge. We can therefore, more gradually divide the north-eastern coast of Alaska into two regions. The line between them passes along the coast of the Fairway, the entire part north-east of the Fairway and the range of the Fairway, beyond which point we know not the water ever about it. The topography of the entire coast is to be known, however, by a good map difference. Mr. Kaseb has shown that the

about 1000 feet

group of mountains is the same range, though I believe it must be more explained. If it is true, the Fairweather mountains are a Tertiary range, while the peaks forming the mountain is a more

toward the south-east, leading to the Fairway and Tachoo Bay. The difference is quite marked. Mr. Kaseb has found raised

\* See *Geog. Mag.*, vol. 10, no. 1, p. 152.

† See Supplements I and II.





[illegible]

10 40'40.00 1238 43 356 14 147.5T

and has not been surveyed. It is situated on the coast survey charts is about 100 miles long by 10 miles in the west and 15 miles in the east, and is about 100 miles long by 10 miles wide. There are a great many islands in the bay. The larger islands, which are on the eastern side for a distance of about twenty miles from the mouth, are lower up, at any rate in part, on the solid ground, and are generally thick wooded, as are a number of ones in the lower part of the bay. The channels between these islands are narrow, and often give the impression of water ways cut through the land. The islands in the upper part of the bay are piled forest. They are of solid rock, and are scored, polished, and rounded by glacial action. They occur singly, are usually elongated, and have the longer axis parallel to the nearest shore. They like the main land descend abruptly into the water, and only at long intervals can even a small beach be found. In this part there are no trees. Several glaciers flow their way down to the water level and discharge large into the bay; some of them are very narrow, and a few are larger rather than the bay proper. All the glaciers of this type; the largest, which runs nearly north and south, has its southern western terminus in the ice bay about 150 miles from the mouth of the glacier. The eastern shore line soon becomes gradually higher, the bay with it well marked bay. The most prominent feature as we approach the glacier being about 100 and a half miles wide at its upper end. On each side are deposits of conglomerate, sand, and gravel, covered with a thin layer of a fine pebbles. On the western side these deposits form a comparative level platform from 150 to 200 feet high which extends about four to five miles of the present coasting of the glacier.

\* Page 174 of 182





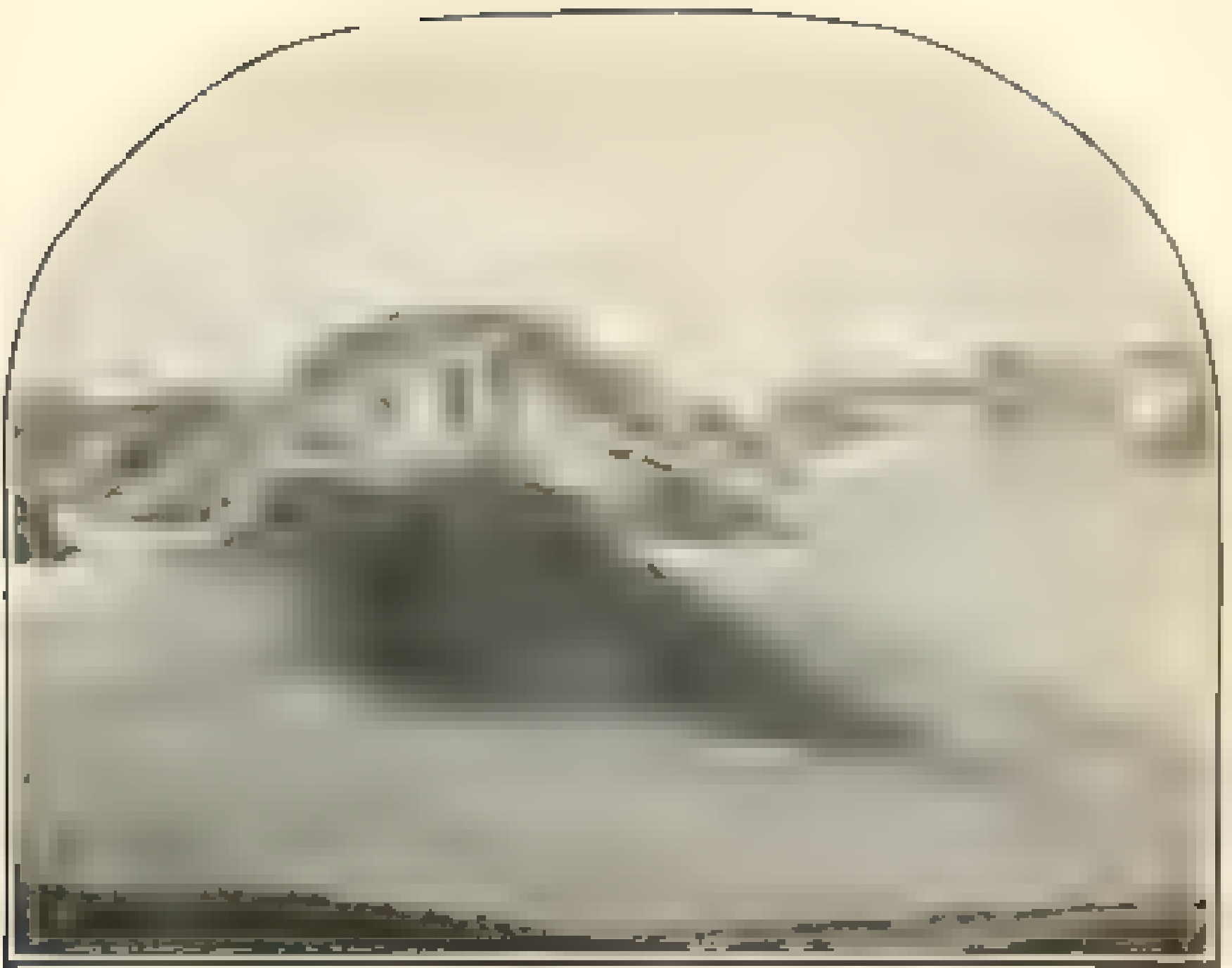






morning at the right, we find three tributaries coming in from the eastward. The first glacier (see plate 4) sweeps around in a great curve from behind Mount Wright, the lower end is completely covered with debris for five or six miles and a half from its mouth. Above it the glacier is particularly even. The whole glacier (see plate 5), which joins the Main just below Mount Luse, is remarkably beautiful. Arising at a series of snow-capped mountains it flows down a broad narrow valley at a range of about 10°, its perfectly white surface marked by the rounded, very symmetrical parallel crevasses of three or four dark mortises. It is about five miles long and half a mile wide. A little farther is the southeastern tributary (see plate 6), fed by a number of smaller glaciers. This glacier is not so broad as the upper one, but it crosses a divide east of Mount Wright, the ice flows from snow-capped peaks on the other side. This divide has an altitude of 2,400 or 2,500 feet. A foot ten miles south-west of our camp a large glacier stream discharges into Chamber Bay. It comes from the southeastern side of the mountains which support these three tributaries.

A little farther eastward is Main valley, which, though it probably once contained a tributary, is now a catchment of Main glacier. The ice flows down this valley in a series of three gulches which appear to have a very slow motion. A few miles down the valley the ice on the right is a high wall facing Main lake, into which it occasionally discharges a surge. The stream leaving this lake flows through a broad flat valley of sands and gravel toward the southeast, and from a small ice lake to the south. The three gulches entering at the eastern end of Main valley also have little gravel-covered floors through which run the streams from the snow fields and small glaciers at their heads. Two of these valleys are beyond the present glaciation of the glacier. It reaches the top of the ice-covered divide across their mouth as behind a fence and is now working its way into the beds. The upper valley is now just as a windmill. The lake which occupies it has been called Big lake on account of the great number of icebergs in it and is named ISUM. Just north of the southern ice divide the ice is carried glacier, so called on account of the medians which are entirely carried into it (see plate 8 and 11). It can be seen from the end of Main glacier, but it is so far east and that one



THE TOWER OF THE TEMPLE



would not suspect that the visible portion is 15 miles long. West of this is separated from the last glacier only by a narrow ridge is another range, a deep gorge with precipitous sides, running about eight miles into the heart of the mountains. The ice

is not great there, nor although I was unable to see even a point of the range which lies on the farther side of the valley, I could see sufficient of it from different points of observation to convince me that its part that is less than a thousand feet above

the floor of the valley. This curious condition seems to be due to the fact that the valley once contained a tributary glacier, which on account of the present smaller supply of ice and the reflection of the heat from the northern side of the range has melted down more rapidly than the surface of the main glacier so that now the range thus formed has been left as a mere barrier and that valley now probably entirely separated from the ice entering at its mouth. The tributaries so far mentioned supply some of the ice which forms the ice-front in Victoria, all the ice coming from the ice that does reach the end of the glacier is not pressed into about 500 yards between the ice-front and the ice at its or the end. If a line were drawn from the point *A* to the eastern side of the first mountain tributary and a second line toward the northwest at right angles to the first, the sources

between the ice

The first line sees a number of tributaries and the range is a present unstriking partial retreating glacier. These are numerous streams of ice fed by a number of small glaciers. The tributaries which run between Victoria and through them are deeper than a with snow, and toward the northwest seem to raise only a few feet above the ice sea. The extremities of these

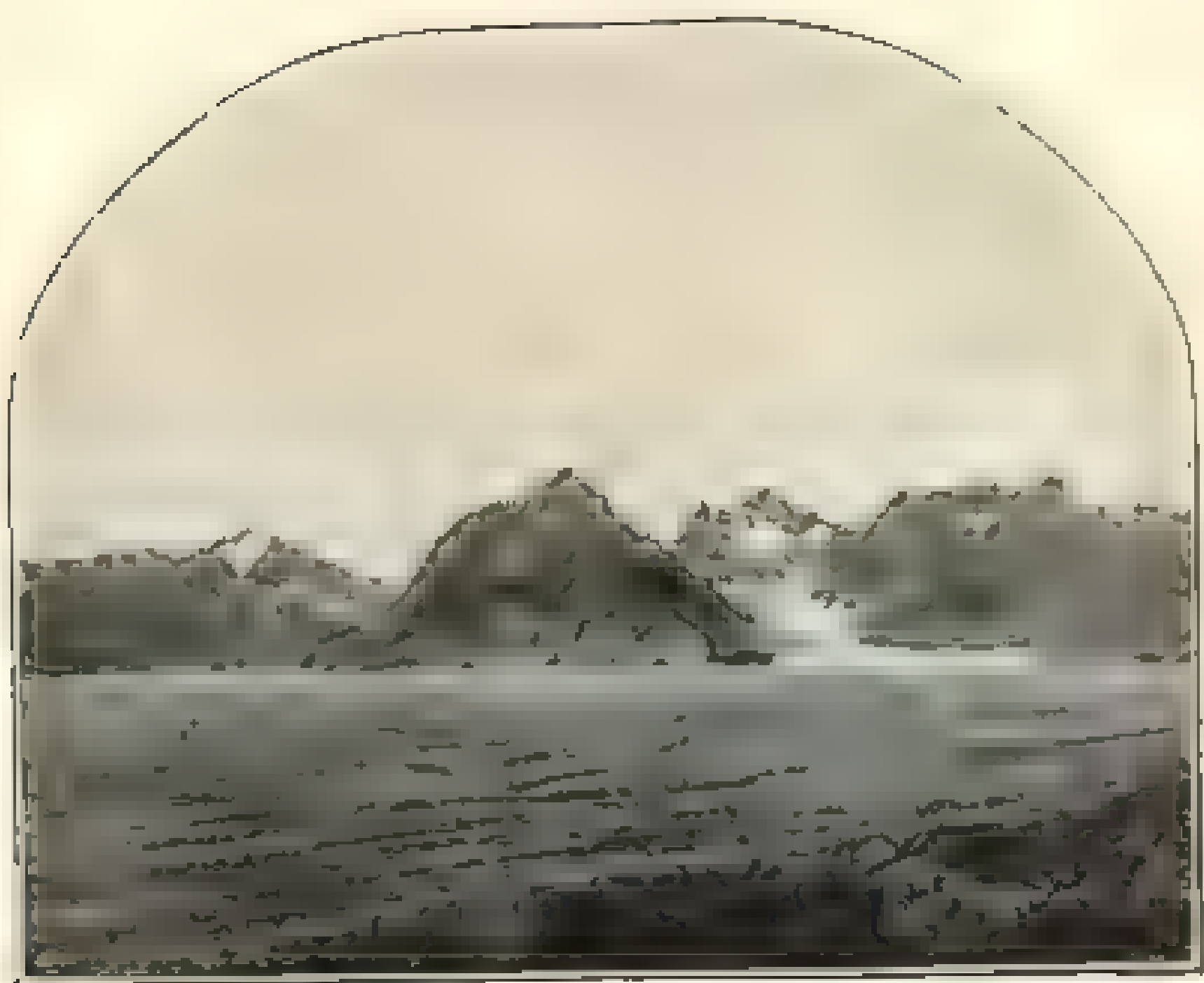
to connect by now divides with each other. The northwestern tributary is fed by two branches, which are small mountains which we called the Snow-cornes. A part of the ice flows over the divide between the first and the second, joins a large glacier which is

The western tributary supplies ice to the ice-front. The source of

ever, according to Professor Williams' report, contained ice and a large granite.









a more varied flora with the *Leptæa* being a characteristic part such as I have noted. The crinoids are abundant and good specimens, the common and almost everywhere to be seen in the strata of a well lake filled in places by patches of water. I have seen, of course, where the bed of the glacial stream is somewhat irregularly bedded with some of the crinoids are again preserved together and there are some with the graptolites and corals. The increase in the width of crevasses during the summer was very not visible. In the beginning of September we were again in crevasses, the water was very clear although the wind rose and Professor Macmillan's boat did not move a distance.

The place where the crevasses were most marked was the narrowest and furthest inland of the glacier's mouth. There two sets of crevasses were to be seen but not the day had been the great longest and longest which, under the influence of the strong wind, melted in some cases into narrow ridges, in others into sharp ridges. The ice, which was the surface, became white and the crevasses were dark, and in a few cases, which finally ends in a dark more or less. This gives the impression of the crevasses deep, but I do not believe that any of these crevasses are much over 10 feet deep. We went on and found that the best exposure, however, was in the section of the crevasses shown in the photograph of the ice out from a well. In the 15th day, and now, in which the crevasses are extended to the water level which is the part of the ice-front is less than 20 feet below the surface of the ice. The whole structure of the ice was everywhere visible. The nature of the process as it could be seen with the strict attention at a high angle.

#### *The upland formation*

In stakes, in the area measure the width of the eastern part between the 11 inches by 7 days, which, indicates a reading of about 2 inches a day. This is not a good reliable, and I was only used it to read as only approximate. In this part, the part of the glacier is very fine, and the water does not flow out on the surface in pools and streams but is like a pump and the water is carried off by some crevasses. The particular place was of 11 and between 11 and 12 feet, a many are are a series which pour into crevasses or moraines. But some of these streams were too large to bear and all of them were protected by fear.

After falling into a crevasse, the water did not reach the edge of the glacier, and soon it was frozen and shut out to the top. We saw a very good example of such a channel. When we first came to the glacier, or by in July, there was a large opening like a sewer in the face of the ice-front near the eastern margin, fifty or a hundred feet above the water level, with a strong stream of very muddy water. The opening must have been 500 square feet in cross-section, of which one-half was occupied by the stream. Now, in November, is a characteristic of water which has flowed along the edge of a glacier, because of the surface water; I therefore infer that this stream was part of the water which flowed along under the ice in the shall ways of the glacier and was converted to ice when it reached the margin which ended in the ice-front. During one day the muddy water stream suddenly sank, and it was as if a levee with the water of the inlet. It is may have been due to either of two causes: 1) the escape of the channel to have been upward as it approached the ice-front, so that as the ice moved on, the hole gave the water a exposed was at lower levels, or 2) a stream may have been formed by cutting an fracture, as we passed here.

On each side of the great large stream issue from the end of the ice at a number of points, and after a distance of between a quarter and a half mile they pay out for a lot, forming numerous lakes. These streams were about twenty feet wide and five feet deep. The current is so swift that they run down as fast as a river, but the point of the outlet of they carry off is a large form of the river. We found that water largely is in the air, and found that although some of the ice would precipitate water in a lower, it would for a few hours, and the water was not so polluted by matter from the ice as. The average diameter of the water is the size of a ball to was of the end of the ice-front it shows that most or some of most discharge is that goes out for a lot or through the ice. A small part of the discharge of the glacier passes down Main valley, but this does not amount to very much. I think the principal sources of the stream in the valley are from the snow fields at smaller glaciers on the side.

#### *Hummocks and Loose Stones*

The hummocks of Main glacier, seen from a distance, are a very striking. Coming from many quarters, they seem to be hummocks





notes that we are veering toward the old "Mary of Limerick" model of just pure corporate love for the poor, but that the 21st-century parish has been born and is off and running. It has not lost sight of those religious averages so that they do not affect the general average. The old Limerick model where the poor were required to make out of this or that or have their needs completely ignored. It is only from an elevated point that they can be tracked.

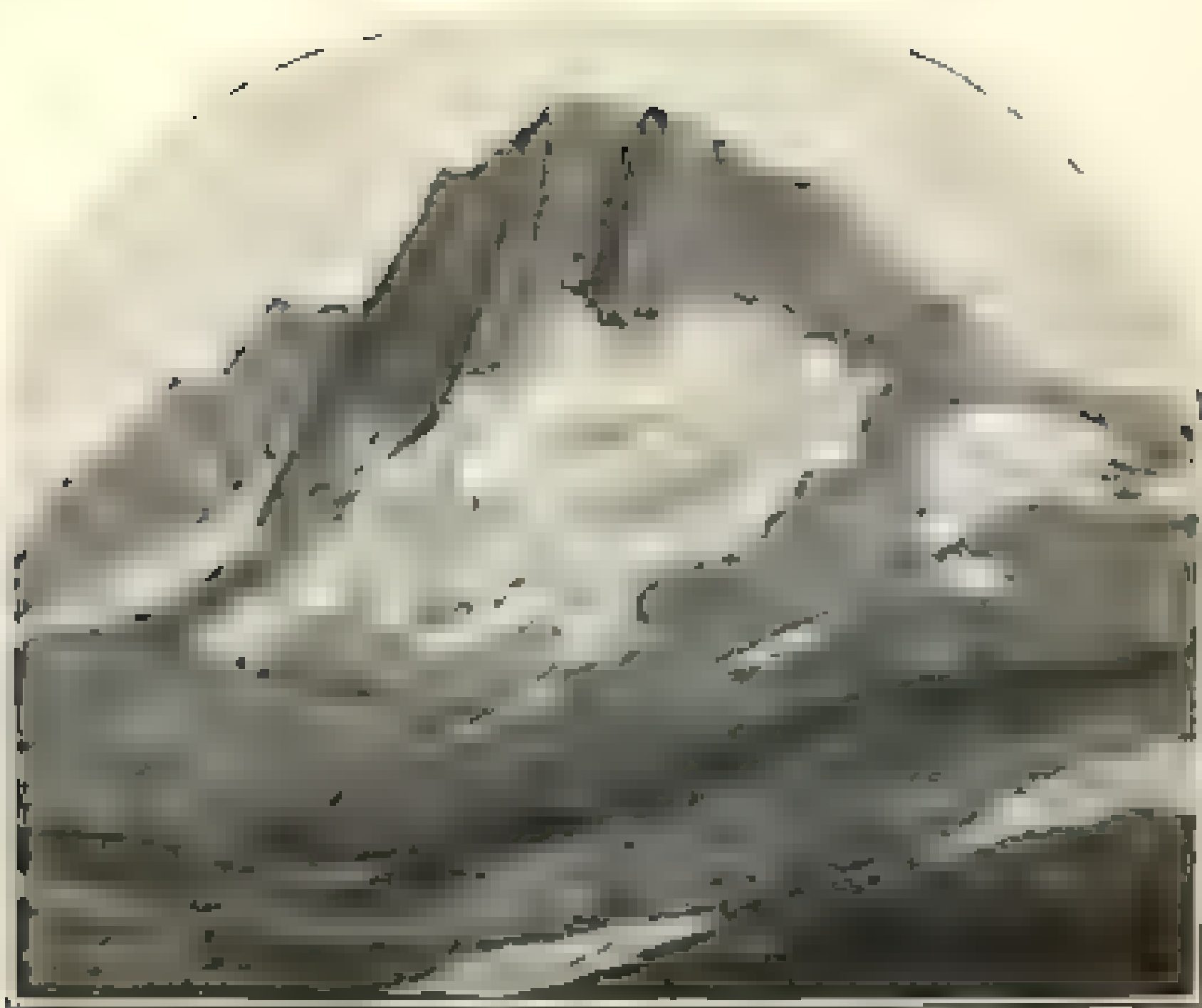
[illegible]

The next group of 4 samples coming from Main valley and Gratitude canyon are plate 10, in the case of  $\delta_1$  where they are apparently not fused, and flow down the steep slope east of the ice-front. These in places are quite different from any I have ever seen or read of. They have two or less, but no large rings. From the region lying between the former named canyon and canyon the ice slopes in with direct ice toward the glacier front and into Main valley. The former slope has been split as a little over 1" the latter is two or three times more. Two of the margins have a very perfect horizontal line as Berg 1 is a typical case in Main lake. This is a group belonging also to the same ice mass as the Gratitude valley, but also a little higher and ends against the snow of the ice wall and short distance from Main valley, or it flows the mountain side to Berg lake. Another in some, coming from the ice front, they are very much about to flow into Main valley and then abruptly change to ice roots in an. Flow to Main lake see plate 11.

A large number of stretches found in *hsp70* H to the car- or N-terminus







M 100 - 100

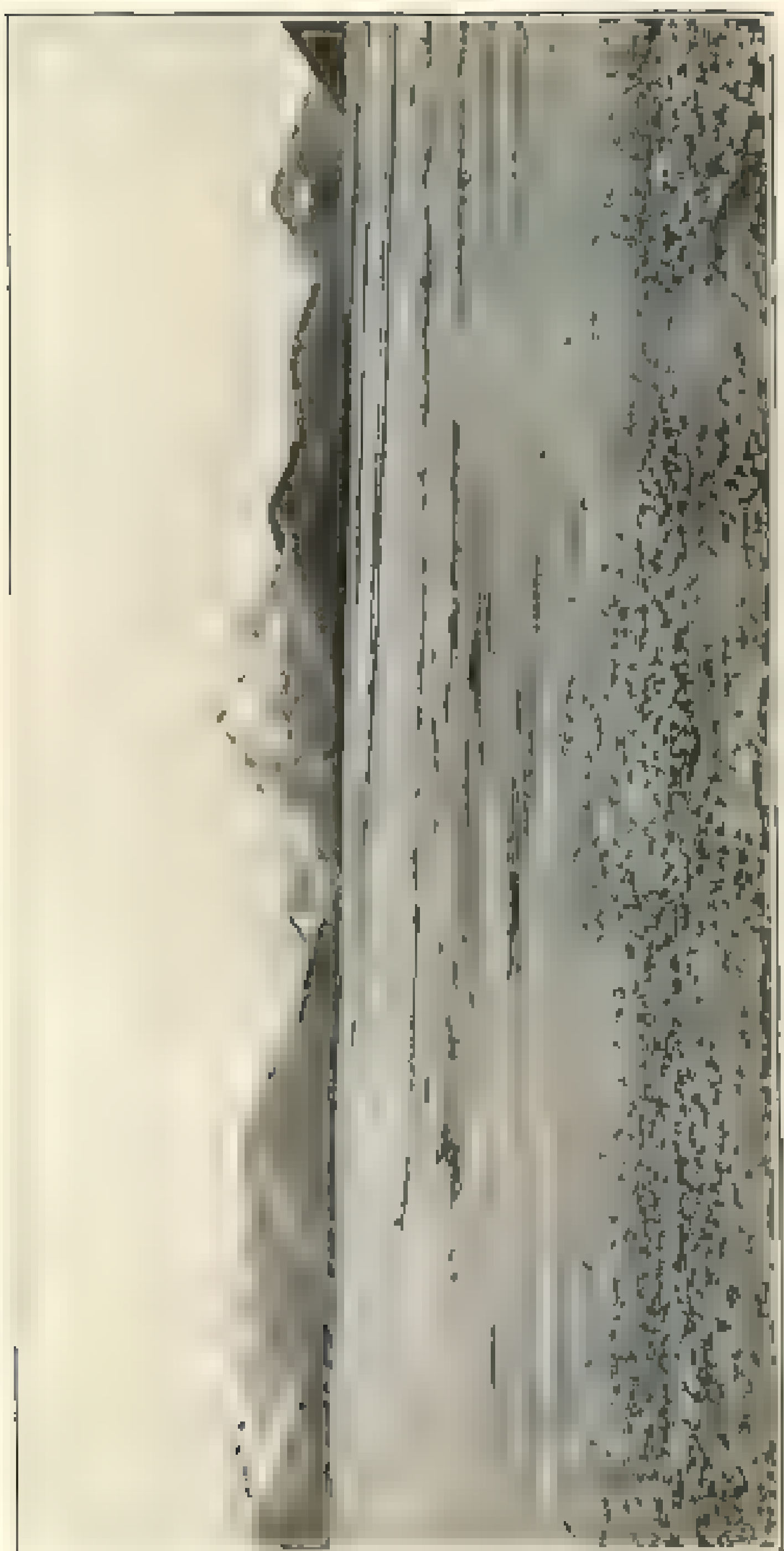


ever since he said that the glacier had passed it round Cape, but that its retreat is quite rapid, etc. The mass ice of forests is the part of old or long, the distance of forest from the shore of the glacier is in situations where the material could not be resisted previous ages for any great length of time. The amount of debris fallen from the glacier is on the eastern side of the lake, the small amount of vegetation on the shore near the glacier, the transverse ridges on the shore, the mass of detached melting ice in front of the glacier, and the small amount of vegetation which makes it probable that a large part of the lake was filled with ice in the last century.

In those cases, as I have said, the full swing of the glacier is on the sides of the lake it has bordered the glacier, and the ice is on the gullies on the eastern slopes, there are traces of ice reaching a hundred feet or more above the present level of the lake. This has been protected from very rapid melting by the ice which covers it. It must have been a considerable part of the glacier not many years ago. On the northwestern side of the lake, there is a spur which projects into the lake of Mackinac, the upper end and most level of the lake is by some 100 or 200 feet higher than the lower end, the ice which has been there since the ice was in a direction parallel to the valley with some small stream, and the ice is abrupt at the upper end, where the ice has been the most of it when it was level with the top of the lake. The whole spur was covered with ice, and the ice is the debris. The stream beds were the disposition of the sand. The fine detritus has been washed away by the water, and the ice has been washed away by the water, and the ice has been washed away by the water. The ice was, and is, a material to the west is at a higher level than the western or north-western tributaries and slopes both toward the north and the south. As it is regular in its position of supply, it must have advanced from the north-western or western tributaries, where the ice must have been at a higher level than they are now. If the ice had been entirely to melt, the surfaces of these two tributaries would have been more rapidly melted than the ice which is now there, and we are therefore forced to conclude that the ice is melting away, but also that it is still melting away. The process has

\* The Great North American, vol. 1, pp. 51.









the level of Vaux may be a few feet less below Wright's estimate of 100 feet and a foot or 2 feet more it would have to be about 1,200 feet below Mount Wright to give a surface slope of about  $\frac{1}{2}$  inch per foot of  $\frac{1}{2}$ °, which is certainly not excessive, would amount to a height of about 1,500 feet on Mount Wright.

Whether the ice was retreating or advancing the old lake bed on Tremont mountain has been to some extent ascertained by a boring at both places and is very interesting. The surface of Tremont here is now about 1,320 feet high. If we suppose the surface melting at the rate of 2 inches a day, a rate observed near the St. Lawrence valley for 100 days in the year, and if we suppose now to be the loss due to the flow of the ice, we find that the ice was about 1½ feet a year. At this rate it would have been at its highest about 1,100 or 1,200 feet above its present surface, about 1,500 and 20 years ago, and if we also consider the loss due to flow the greatest height must have been even less than this recently. The rate of recession would have continued for a longer period if the ice would have been lower than it is. It follows that from 10 to 20 years ago, at least, the rate of loss of ice in the present case of Tremont mountain was diminished by a sample which was certainly only derived from a narrow valley. The conclusion is, therefore, that the mountains in the valley. They could not have retreated and their present rise, though in two directions, for a long period without having been very attenuated. Taking this so far into consideration, it now looks rather unreasonable to suppose that the greatest extent of the glacier was reached 150 or 200 years ago.

#### *Evidence that the last Advance was of Short Duration*

I have already mentioned the stratified deposits on the summit of Mount Tremont over which the ice must have passed. We have seen that some of the age at the east end of the glacier, where the ice rests on a high deposit. In a gully on the east end eastern side of the ice field a few feet below the point where the ice has been retreating on the side. Although some of the graves, and a few other small holes, it is hardly possible that they should have resisted the grinding action of the glacier for many centuries, especially when the ice was much thicker than it is now. Mr. C. V. dog has called my attention to the fact that a gully on the eastern side of Tremont and others on Mt. Lehigh correspond in direction to the glacial scabbling, and therefore could not have been excavated by the glacier. Many geologists would consider this a proof of the immensity of the glacial forces which have been at work. It may be that







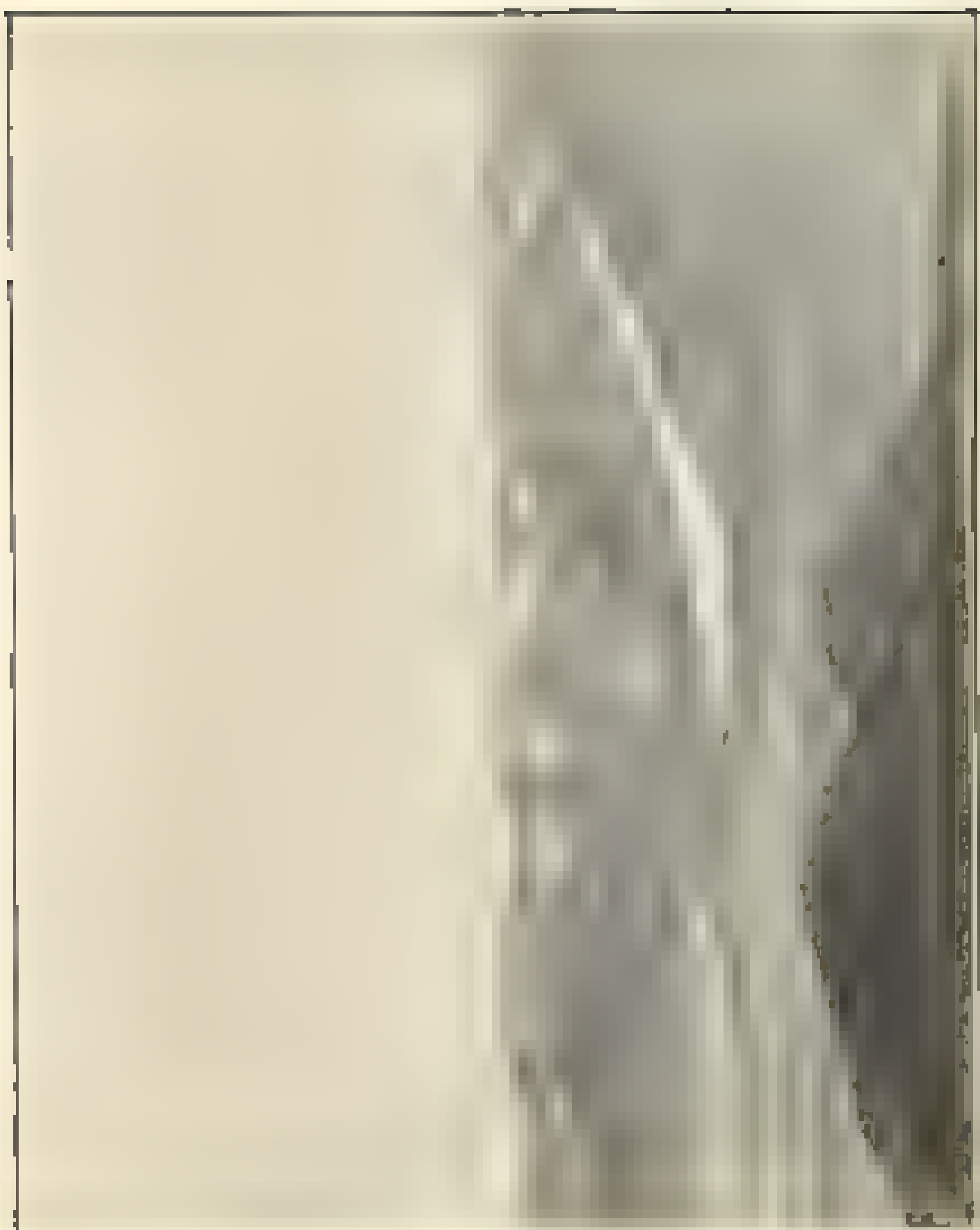


in its extension to the accessible mountains, the glaciers of the Alps were not by any means extensive then at present, as I had hopes were able to cross passes now rendered almost impassable by ice and snow. Even in the seventeenth and eighteenth centuries the glaciers increased, attaining their greatest extent in the beginning of the nineteenth \* At present they are in general retreating. The snows are much more extensive and almost as rapid as in the time of the glaciers of the Alps.

*A possible cause of the recent retreat*

At the time Mr. Hall was very young one of the sons of the English colony had a range of large trees, which Professor Miller assures me are in place. The trees must have grown, of course, above the glacier. They are now 150 feet below the rock. (I though I cannot say so with certainty, it is not unreasonable to suppose that they were like those of the natural forest which, now, most of the same species as those now growing in Alaska, but we must remember that they had attained to a size which is not known here to be reached, at least the supposition itself. If, therefore, these trees were growing at the same time as those of the natural forest, the glacier has advanced some 150 feet of at least 20 feet since the establishment of the glacier; it may have been much more, if so, it would have produced an increase in the normal temperature, which would have increased the rate of melting and would also have decreased the proportion of the solid to the liquid precipitation, and on account of the general lowering of temperature, more of the moisture from the air may have been carried off by rain and precipitated before it could melt. All of these reasons would tend to diminish the extent of the glacier. Not only that, but the accumulation itself would increase the rate of evaporation, for the presence of extensive snow-fields must lower the mean annual temperature, so far as the air is concerned, and this decrease be proportional to the total precipitation. If it may cause these snow-fields because of their influence on the downward radiation, sometimes less the snow-fields are melted and the snow-fields become smaller still. So we see that a slight increase or a slight change in the mean temperature may result finally in quite a large variation in the extension of the glacier although the large variations may reach the limit of our knowledge of the cause, which started it has caused to

\* Agassiz, *Glaciers and Ice Changes*, 1840, chap. xv.





to be advancing or retreating. The suggestion however is not that the ice is what is to be expected. In other words, glaciers are never exactly in a state of equilibrium with the surrounding environment.

*Remarks on the ice front*

As a lake and lake ice are now separated very considerably, and it will not be long before they are. This will assist in the deglaciation of Berg Lake, which event will probably be marked by a flood. The melting of ice in May is quite total on the ice, for the great extent of its surface is exposed to a large surface for melting. Water the temperature of has risen at two or three miles and the surface of the ice has sunk two or three hundred feet since from the first accumulation from the south-western tributaries was probably at an early date of the May valley. The small lake which occupies a lateral valley opening into the main canyon will probably extend as the ice diminishes and probably occupy a large part of the canyon itself.

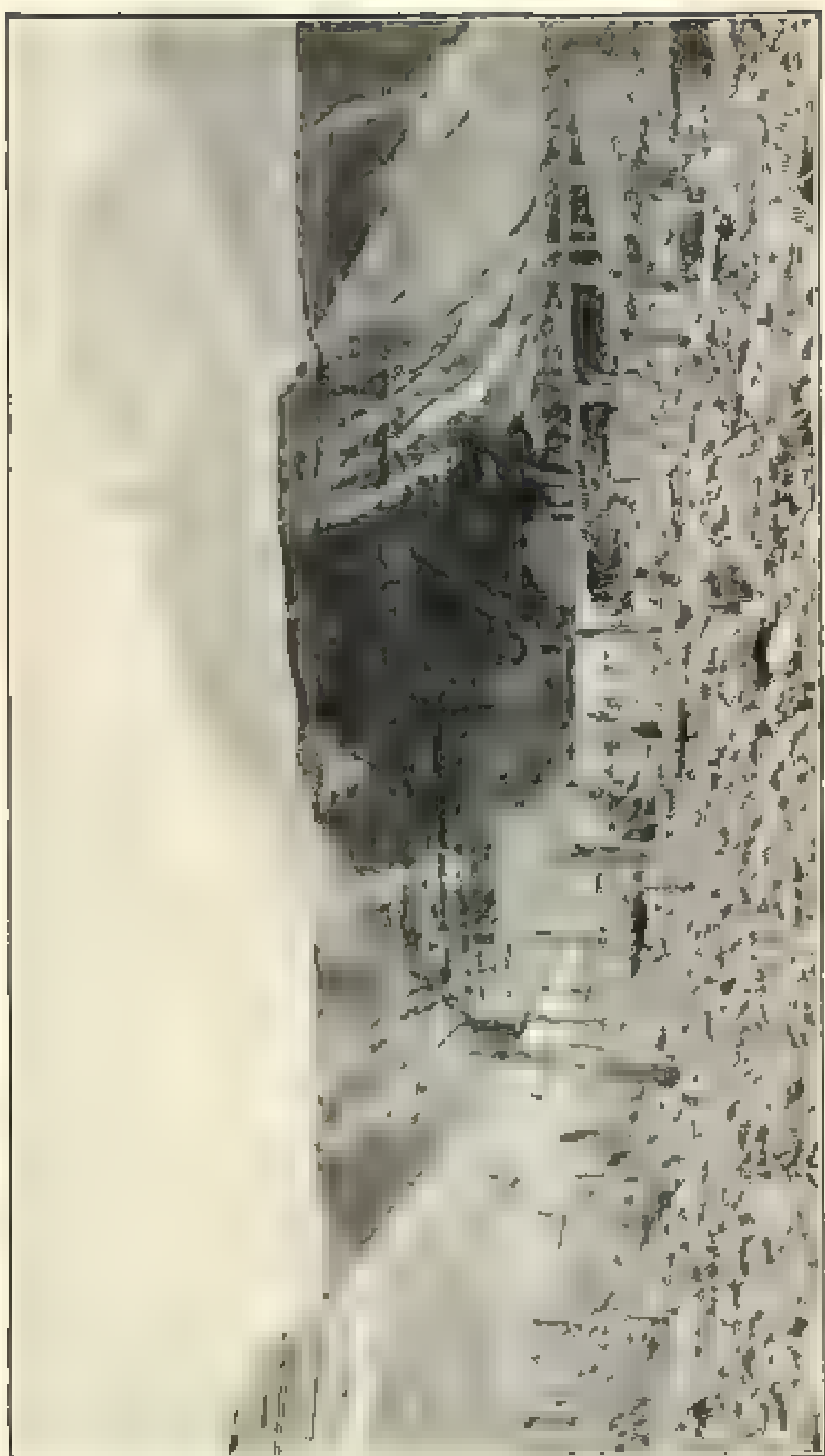
Professor Wright has kindly sent me some photographs which he took of the glacier in 1886. By comparing these with our own and from my fix on our map, with in 100 yards the position of the ice front at the time of Professor Wright's visit. This shows that in the four years from 1886 to 1890 the western end of the ice front has receded 1,500 yards and the eastern end 1,000 yards. The centre also has receded about 1,200 yards so that the average recession of the present ice is little over 1,000 yards in four years or say a mile in seven years.

Professor Wright writes me that his notes of his first visit to the glacier in 187 show that the ice then extended about to our station for the first of retreat observed from the ice was nearly two miles with the ice above. The ice front therefore must have extended as far as the ice 20 years ago. He says that the ice was then very close to the water from which it corresponded a large quantity of ice was being broken off, and this could hardly have been entire-ly prevented for by a greater removal of the ice a great amount of the many obstructions in the neighbourhood of the present position of the ice front.

It does not seem at all probable that the ice from the various glaciers of the ice may have retreated to all a large part of the ice a hundred years ago. Professor Wright's











was almost at right angles to the  $xy$ -axis,  $z = P-H$ . The change in the positions of the flags could be well measured from these 2 angles, with a rotation of a large angle  $w$  with the  $xy$ -axis, or at right angles to the flags. The part of this motion at right angles to the  $xy$ -axis was taken as the actual motion  $w$ . We have this as for the first period from July 21 to 24, two sets of actual measurements, one from  $K$  and one from  $H$ , which agree very well. The average is given in the table for 14 cases and actual, measured values of  $w$  are given for each  $K$  only. The average is for 10 cases flags from  $K$  which were given from July 24 to August 8, are given with the mean length of set and actual values are given in order when the number is 1. The actual results of the measurements of the angles, measured very carefully at the angles, measured actually toward the center, were also made to give the first 14 cases. A closer comparison of the sets of the measurements, the  $xy$ -axis is from the origin to the apex of the flags then series, shows that there is a possible, however small, systematic error of some three feet in the determination of the positions of the outer flag, and not more than half so much for that of the inner flag.\*

\* The following is done if the flags in the  $xy$ -

Date	Obs. at feet from	Value $w$ , angle flags in feet			
			I	II	III
July 21	10	10	10	10	10
			10	10	10
			10	10	10
			10	10	10
July 22	10	10	10	10	10
			10	10	10
			10	10	10
			10	10	10
July 23	10	10	10	10	10
			10	10	10
			10	10	10
			10	10	10

- I This is measured from July 21 to 24  
 II " " " " August 4 to 8  
 III " " " " July 21 to 24 and 25  
 IV These values of the  $w$  are given for each flag

\* This flag is the one first being used and is now fixed at 10. The measurements were taken from the first set of measurements and from the second set of measurements. It was found that the flag was not fixed only 21 to Aug 1.

The ice divides into two main branches, which are largely isolated in a line over a mile long, and terminates near the margin of the glacier, as shown in the map. The ice movement was determined from August 6 to 22. The table gives the total movement during that time at right angles to the line of the flag, which was the direction of the shore. The examination of the markings shows that this is not precisely at a right angle to the shore.

#### Movement of Strains

1	1
2	1 1/2 inches
3	1 1/2
4	
5	0

1 = a point 10 to about 15 ft. away from the shore on flag.

5 = distance between at the E side of the crevasse.

*Crevasse between.* It has been long recognized that the comparatively slow creep movement of the glacier is due to the

### THE FLOW OF ICE

general expansion, which is the quantity of ice flowing down and then out by melting. The main temperature of the valley increases as we ascend, if there is no wind, and the ice should melt more beyond the wind, where the rate of melting is thus increased, so supply the ice would melt more rapidly and the ice would move on. If the ice is not melted, the glacier would be a thin, thin point, and would flow down faster than it would melt, and the ice of the glacier would advance. This point is not merely a point of equal rate, but a point of equilibrium. This explanation is rather simple, so long as we do not look upon the ice as a whole, but as a whole. For when we consider each part of the ice, by itself we can see that the rate of melting is not the same as the rate of expansion.

As we approach the end of the glacier the surface of the ice becomes more irregular and steeper and frequently becomes too irregular to allow one to stand on it. The diagram (figure 1) shows the form of the surface just before it begins to melt out. Now, we divide the glacier again into layers. We know that the strata on a deep water bed of a water bed in a dry bed may be a plate with a slight concave such shape, but this is the result of pressure forces which you do not have any appreciable about a large block where a glacier is. The end of a flowing glacier seems to all have a somewhat similar form, but this is a case of coincidence and does not represent an equilibrium. These similarities do not answer the question. If we divide the glacier into layers by a series of surfaces parallel to the direction of flow, the conclusion that the end shall be shall only requires that the ice surface of the upper layer shall be melted at its end. Now, the upper layers move more rapidly than the lower ones, therefore the ice is melted out more rapidly. As you see at the diagram it shows that the rounded of the form of the end of the glacier, the ends of the upper layers expose a larger surface than the lower layers, the air and sun, resulting in their more rapid melting. This is a rough method to get a part of the explanation of the way of it for the form of the glacier end would be an old method in a new form. If a rising stream caused the surface to become somewhat steeper, the exposed ends of the upper layers would melt more rapidly, and these layers would no longer melt away rapidly as they advance the surface would continue to grow upward until the upper part would break off and thus restore the slope. Although glacier is have been observed to advance I have never found it melting in this manner. A series of more

examples of the internal direction of motion and the rate of melting at the end of the glacier such as the former of the ice sheet, as suggested, it would be absolutely the whole of the

At the end of the valley of a river glacier. Take in all there is a broad exposure of gravel, etc. to which the glacier, after melting from its proper, spreads itself like a great fan, thus preserving it away from the air and sun so that the melting of the ice is as rapid as the supply\*. If it were prevented from spreading it would extend much further than it does and would melt out

At the end of the valley of a river glacier. Take in all there is a broad exposure of gravel, etc. to which the glacier, after melting from its proper, spreads itself like a great fan, thus preserving it away from the air and sun so that the melting of the ice is as rapid as the supply\*. If it were prevented from spreading it would extend much further than it does and would melt out

\* It is a fact that when the glacier has been melted out there is a











[illegible]

However, at the bottom of the glacier, the channel will be too narrow to permit the ice to retreat, so that the ice will advance, where it meets the salt water, until it reaches the advance. The slow ice retreat period is passed, however, by the stretching of the ice. If the progression of the boundary is greater than the rate at which the glacier wall advances, it then ceases to advance part of the time. If, now, the progression is beyond a limit for the year, it then retreats, with an average depth of 1000 feet, the ice would then advance part of the year, but not at the end of the year.

[illegible]

It is important to note that the above results are based on the assumption that the data are stationary. If the data are non-stationary, the results may be biased. Therefore, it is important to check for stationarity before using the above methods.

if a gopher has water which is so deep that it is not possible to get out, and if the water is more rapid than the gopher can be carrying the water will be forced further in. It is a possibility that the gopher will be able to get out, but the water is so deep that the gopher will be forced to get out, and the water will be so deep that the gopher will be forced to get out. The gopher will be forced to get out, and the water will be so deep that the gopher will be forced to get out. The gopher will be forced to get out, and the water will be so deep that the gopher will be forced to get out.

#### General Features

The general features of the station are as follows: The station is a small, rectangular, concrete structure, about 10 feet long and 5 feet wide. It is situated in a small, rectangular, concrete structure, about 10 feet long and 5 feet wide. It is situated in a small, rectangular, concrete structure, about 10 feet long and 5 feet wide. It is situated in a small, rectangular, concrete structure, about 10 feet long and 5 feet wide.

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\* These dimensions are given from the center.

† The following are the dimensions of the station: 10 feet long, 5 feet wide, 5 feet high. The station is a small, rectangular, concrete structure, about 10 feet long and 5 feet wide. It is situated in a small, rectangular, concrete structure, about 10 feet long and 5 feet wide.

The collection of evidence can not be complete. But much more can be done by the use of the rank and the the knowledge of the nature of the data. Now the point of the foregoing is that the use of the rank is not to be confused with the use of the rank for the purpose of the rank in the case of the rank.

our  $m$  and are the thick ones of 1 or two per cently greater than elsewhere. It does not seem excessive to consider the pressure here five or ten times as great as the average. The correlation between  $\epsilon_0$  and  $H$  probably varies but is probably less than

[illegible][illegible]

It is furthermore to be observed that the planter would not be in a position to do so until he had received the seed which would not be a single year in advance of the crop which he had to sow. We have not taken into account, however, the possibility of a third crop being raised in a year or before it was sown, assuming that the possibility of having a second or third crop was not within the scope of the farmer's plan. We will therefore be in a position to find out

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## H. P. HALL—*Studies in Arctic Meteorology*

ery tall, dark snow on the surface of the snow, and is probably due to the different rates of erosion of these two.

### METEOROLOGICAL NOTES.

The prevailing wind in the Alaskan coast is from the south-west, but the glacier by causing the air in contact with it, produces a local effect which is the reverse. The general easterly wind blew on that day and carried up a great deal of snow, a strong southerly gale occurring at 10 P. M. when we returned. Early the wind was from the west and in A. M. it was from the north-west, in fact, everywhere it flowed down the slope of the glacier. Its influence on the temperature was very marked. The morning temperature during July and August was  $45^{\circ}$  F. and at 10<sup>0</sup> lower than that at J. M. during the same period, while at the same place is only about 10 miles further on the coast. At noon a strong gale blew from the south, freezing temperature being on.

The wind waves did not usually extend very far, the greatest number being only about 100 feet, and not 1000 feet above our camp where the flag was often blowing toward the south. The

FIGURE 1.—Diagram showing the direction of deflection.

temperature was higher on elevations than lower down. At 1 P. M. the general direction of it was once reversed,  $25^{\circ}$  C. at 1 P. M. higher than at camp, and at the same time, on the top of the mountain (2,700 ft) the temperature was  $4^{\circ}$  F. ( $-4^{\circ}$  F.), which

The increase of temperature with altitude can be seen at the same place, a decrease of density in the atmosphere, with a corresponding increase in refraction, being one of the causes which is so responsible for the mirage which one sees both the observer and the object in the cold layer. A mirage being met with the observer after leaving a horizontal position of rising slowly and then being refracted down again. The same is to make the object appear stretched out and to give it an immense height. We then saw islands with a perfectly vertical surface, the peaks and higher bay were recognized vertically as well as

work like the red-fronted sunbird, a glaucous blue perched on a blue flower and a yellow and black one on a white. These upland species over-ventilate, by means of wide stretches of the migration, to the mountain "red-fronted sunbird" and its "lighter" in some birds is not a desert but a response. This change is just 1. opposite to what we see in the desert. If the rays are bent up, making them appear bent as if it were reflected from the surface of water.

are the rays are to be drawn, yet the reflecting action still remains entirely unpermeated or unaltered from the object but only renders the latter apparent distended as though it were increased twelve or fifteen times extended upon itself.

We had rain or showers, but no exposure, all of one day, and the wind was blowing from the north. August 18, September was a hot wet one. There were no local forest fires, and usually the rain was in small drops. The grass and rice were frequently seen, so frequently that I think they have been covered every night recently and the normal height, of course, has again would have reached the normal height of the ear in the rice to eight, which lasted a long time, would not have dropped if they occurred.

7. 4. 1944.

A tape line was measured off with a steel tape from  $A$  to  $B$  on the plateau on the western side of  $C$  and led there via foot-hills even ground. The line was measured twice, first from  $A$  to  $B$  and then from  $B$  to  $A$ . The two values obtained were 0.231 and 0.230 m, respectively. The length of  $AB$  was 0.232 m and 0.234 m, by means of the same tape, were obtained at stations 1, 2, 3, and 4, the points  $A$ ,  $B$ ,  $D$  and  $E$ ,  $A$ ,  $B$ ,  $F$ ,  $G$ ,  $H$ ,  $I$ ,  $J$ ,  $K$ ,  $L$  and  $M$  respectively with the plate. This instrument was set up at  $A$  and,  $D$ ,  $E$ ,  $H$ ,  $I$ ,  $J$ ,  $K$ ,  $L$ ,  $M$ ,  $N$ ,  $O$ ,  $P$ ,  $Q$ ,  $R$ ,  $S$ ,  $T$  and  $U$  for the general map. The points  $A$

\* The character of the wood in the uppermost part of the 100 ft. sandstone was used to determine the age of the deposition of the 100 ft. sandstone and to compare with the age determined by the same wood in the lower part of the sequence, which is still exposed. A 100 ft. sandstone core was obtained for a comparison and found that the 100 ft. sandstone is the same as the 100 ft. sandstone in the lower part of the 100 ft. sandstone, and the same as the 100 ft. sandstone in the lower part of the 100 ft. sandstone.

described in my previous paper was run off from Cairns, D. L., and M. H. and graphs were run off by ordinary means, and I also have been of this great service, withdrawing in charge and began rapidly. As the appearance of the insects I found that some of the joints marked by  $\odot$  are not at their place by 1/2 of their maximum from  $\phi_1$ , may not only be very small but also. Many joints were either cracks and were not visible, and were of course, determined out with much less accuracy.

In order to be able to compare with the two surveys I at Cairns in this region we made two series of survey stations, one at D and one at P. D is on the gravelly and the eastern side of the marsh at a height of 10 feet above mean tide. P is on the side of the ridge of sand rising from Cairns. Weigh at an average of 800 feet. The horizontal distance between D and P is 750 yards and the line of sight a true north  $N. 41^{\circ} 40' E.$

The latitude of Cairns, was determined on several occasions at the geodesic  $58^{\circ} 41' 7$ , and have no error by more than a millimetre. The longitude was not determined, but first we got an observation on a meridian was a good one, low, and when we left, it appeared to be a reasonable value. The observations of the sun were not sufficient to determine an angle ourselves to give the results by comparison with our local time. The longitude also, and by reference to the best maps of the region in the Cairns Survey and is about  $150^{\circ} 5' W.$ , which may hardly be in error.

In planning our survey to be a good survey to the United States West and Canadian Survey, we see that the area we survey covers a large part of the region between Lynn Canal, U. S. and over and the upper part of Vancouver Bay. The fact that is a thin line, any part of our map must be a part of Lynn Canal, which is a part of the twelve miles of the bay from glacier must have a narrow in the middle is which place to put the survey. There is a narrow at the end of the bay where we are intended to make the passage to the river bay over the Bay de la and M. de la. It is a narrow bay is probably a low divide between the territory of Dawson and the first northern territory of the. Unfortunately, we were unable to see.

The scale of the general map is 1:250,000, which is a good one, but when the detail we were able to make out except in the north, showed the point of the bay. I have a good point of view



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at 20000, intervals, but not be regarded as actual time profiles, to be discussed, but merely serve to show the general form of the surface as well as to indicate values of  $k$  and  $f$  directly and photographically. The altitudes above mean sea level which were determined trigonometrically are given in black figures. Those determined by barometer or estimated, in blue figures. Camp Maize was estimated to be 25 feet above mean tide.

In the table I have made a separate column for each position which is marked by position on the maps we used by measuring the number of degrees from the form of position of the topograph at various times. The contour lines here are only very roughly approximated. The interval between them is 10 feet. The values are given either in terms of trigonometry, except those on the coast at times when no estimate

NOTES ON THE GEOLOGY OF THE LONDON OF  
THE 16th & 17th CENTURIES

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Both a gneiss and igneous rocks occur in the vicinity of Moberly and the plutonic rocks having formed at different periods all the rocks of this vicinity have suffered more or less equally in recent crustal warping. The whole series is roughly about north and south. The south of Moberly are given by the following table showing the rock masses in approximate lines. These fissure zones are solid and extend out at great varying angles to each other, they are more or less, often well defined, but are not necessarily having a well defined surface. The outcrops of all kinds of igneous rock appear to have the same distribution. The fissure systems are therefore probably formed at the same or within a very short interval of a comparatively recent origin involving these rocks and determined by the same movement. It is not unlikely, although a certain amount of disturbance of the regions as they were formed. Evidently a fault or line is added to the column owing to the presence of the igneous rocks and the

area. The gullies & working of the contact is of a sort very different from the distribution of the working planes that is found at that contact with the rest of the gullies. I took place, I note, the formation of the gullies. The strike of the contact here rocks is about  $N. 70^{\circ} W. - N. 80^{\circ} W.$  approximately. The  $E. g.$  are generally at high angles but not the south but are extremely variable. Some gullies are not only very steep but are also very large. Fold are not so common. Some of the folds are synclinal, some are only minor and are of neither the normal nor gently up way to the prevailing south-south dip. The so frequent variation in dip generally on a small scale consists of long or abundant areas of a considerable dip. It is also a very common feature along the shore, generally produced by a combination of dip and so on, but also a variety of the rocks in fact, or the rock is any determination of the variation of the dip is impossible. Sufficient evidence was not observed to establish a very definite type of movement and the working here. The dip is pretty consistent away from the north-south strike. I were too to get north-south strike. I think we can know. The work of the is it is it is possible that we have here a very hard exposed rock surface formed by the gullies.

[illegible]

Two great series of semi-relict rocks are exposed in the  
Lake Superior region, one of age like the rest of Laurentia, the  
other of great antiquity. The Laurentian is the younger. The  
contact between the two is well shown on the eastern shore of  
the bay, but an extremely steep and very rugged road pre-  
vents one from getting to the actual present foot of the  
older

[illegible]

1. Very low plasma-growth rate and the electronic bands of some of the varying widths, corresponding to the varying of the plasma density.

<sup>2</sup> For policy notes and further details, see <http://www.fairtradechina.org>.

or large part of the surface, are bands of a more regular and more uniform thickness containing glassy or rather less transparent material. The last form is by no means uncommon. The first variety is more abundant in the lower portion of the series, the second in the upper. Both are very fine grained and fine grained and extremely compact. The first variety when fresh is a dark brown color, the gray to a yellowish brown on a sandy looking surface. These ground metamorphic colors to the westward in the northeastern portion of the area of the series, a moderate amount of peeling one color or the other as it is a local iron oxide or iron sulfide. The extreme last case of these series is due to their metamorphic of metamorphism. The degree of metamorphism is quite uniform throughout, so far as can be told by the color of the rocks, but a narrow to a point where recrystallization has been so that some of these rocks are at all schistose in character. The metamorphic and the numerous fissures which cut these rocks have nearly obliterated the old bedding planes, so that dips are generally most perpendicular from a distance owing to the local appearance given by the presence of the two varieties. In the case of the series to the westward the original bedding planes is now shown by the fissures of the bedding plane at the size of the rocks which the rocks are in a display the most of the rocks. These are also well shown in many cases; for example on the high glaucous dip of Mount Wright which face the west.

3. Comparatively thin bands of more fresh black graphitic slates are found interstratified with the others. These are found in numerous localities and these are certainly seen in bands though the apparent number may be increased by faulting. They are softer than the other slates, and tend to split into thin, even slabs. They become cotton with brown spots at weathering. The fissures which intersect the slates are commonly filled wholly or in part, by crystalline calcite, some of the bedding is weathered and more or less. This is very common in the black slates, and more common in the gray, but each filling is a small amount of the graphitic slates. This would indicate that the calcite is a later was largely derived from the slates themselves, and that the graphitic slates lack it from having been a mudstone originally. In general these are more or less but occasionally weather fissures occur with a small amount of local fissures. The large amount of the crystalline

sample was of the order  $10^{-2}$  mole/l. For a more detailed description of the procedure, the reader is referred to the original paper characterized on the basis of the one-step force of Pyranol polymerization, which also observed the change in dielectric value  $\epsilon_2$  of the water in the reaction system. The polymerization of the monomer gives a more homogeneous system after a short time, as is evident from the following results:

[illegible]

*The Female.*—The color is returning to brown on the larger parts of the body, and on the sides of the head, except the eye. A considerable number of scales that are a deep fawn color, are lost. The skin beneath it is a smoky-buff color, forming the immediate peak just beneath the peak of the snout. It might be seen along the outer margin of the dorsal fin, as the scales were shed, and then abruptly plain as shown on the above with a few scales immediately above. Next the scales were shed above the dorsal fin, and a bright greenish yellow line appeared where it is on the male. The abdominal scales were being shed only a trace of brown in color. More commonly it is of a dark purplish red. It might be seen just above the anal fin. It went by the same system as the male, but as is to be seen on the outer part nearest the end of the body, every second scale fully tells the story, so that if this be seen, we can positively search for females in the question was raised. But on some beauty, on the same day, I saw one have a scale shed, and it was not shed. I saw that it was a female. The only young ones I saw were only two.

While the old negro community was not at all unrepresented by our party, particularly in the more educated and more intelligent classes, it was impossible to overlook the fact that the new negro would be represented almost entirely by the old party. It is well known that Professor H. S. May was the only member of the old party who represented the negro community in the national convention. The negro community was being made up of the masses who had completely forgotten careful examination; they had not been producing things, and it is a pity to find that all that they could do to overcome this situation. These questions out of the last election were not really, and it is a pity to find that they were not really. It appears, however, to be with a very few leaders of the old party, and the new party.





[illegible]

The small exposures of rock, mostly disintegrated by the main quartzite, a times (or more) may be washed by the water, especially in quiet weather, so that they are the most noticeable part of a road where it crosses the strata. E. is either from the southern projection of the ridge west of Toronto, or from the third is from the quartzite masses on the shore of the bay between all at Mount St. Charles. Their relation to the main mass could not be determined. They are very disintegrated from the main mass, which is very uniform in composition, by their greater percentage of crystalline and their greater resistance. The evidence as to the migrating rock is only a small part of a whole, and of the fact that the disintegration of these rocks.

These quartzite fragments and nodules are of all sizes and are scattered upon the whole surface of the granite rocks for a few feet from the boundary between the two rocks. They are cut by the same sets of fissures, though it is good to observe that they are also cut by the more recent cracks. The fragments are gray, greenish gray, and yellowish, and are composed of the same minerals as the granite. They are cemented by the same material in the field and show the cleavage found everywhere in the granite as far as is observed. The cleavage

Later,  $A \times \mu = 0$ . All the new projections described are out of the new  $\mu$  and  $\mu$  has of later type. There is a lot of new projections which were not appeared. They are not in all possible other



**United Kingdom**

2010年12月10日

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## VOTING ON SOME PROPOSED REFORMS, 1990-1991

$$f_{\text{eff}} = \frac{1}{2} \left( \frac{1}{f_1} + \frac{1}{f_2} \right) \quad (10) \quad \text{If } f_1 \neq f_2 \text{ then } f_{\text{eff}} = \frac{1}{2} \left( \frac{1}{f_1} + \frac{1}{f_2} \right)$$

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1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

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International Journal of Health Services

על פי ד"ר יעקב גולדברג

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newer and later bands in which the grains are larger and the porphyroblasts larger. The foliation in these rocks is not so well developed as in the

hornblende zone lying westward, and is replaced by larger crystals.

Further east, crossing the hornblende zone and reaching the contact with the granite, it has the usual tendency to become a granite topose, where it has undergone complete anatexis. It is composed of a mixture of quartz, albite and perthite, with a great quantity of pyroxene. The albite crystals are intimately intergrown with small areas of the hornblende in the contact zone, looking as though they had migrated from the interior of the hornblende. A narrow fringe of hornblende occurs at irregular intervals pyroxene, where every grain of hornblende occurring in the pyroxene is surrounded by a larger hornblende fragment. The albite is here and there cut by thin veins of hornblende. It is also more rapidly altered to sericite and saussureite.

*Amphibolite zone.* This rock, number 3, has a much finer grain than the preceding, and it has formed a morphologically very interesting and valuable prospecting indicator. As a consequence of this the amount of its exposure is probably less and more irregular than in the case of the preceding. It is a dark hornblende, and is level in the contact zone, except that rock is found in the contact which are more deeply dissected, like the hornblende zone, and projects.

Number 4 is a rock quite like the last, but which shows evidence of a more extensive metamorphism. It contains a great deal of pyroxene in the part exposed on the contact. All the contact effects show the effects of pressure, and the hornblende is not, like the last, a disintegrated mass, but is a beautiful crystalline granular mass of the region.

Number 5 is made up of a gneiss-bearing monzonite, which like the last does not show much evidence of extreme effects of crystallization. Its foliation is not broken up and granulated, while the albite grains pyroxene is present. There is a difference in the grain size of the monzonite as the case in the region of hornblende and granite, the former being cut by a foliation. Its main crystals are also greatly altered.

\* All of the four preceding rocks show a striking resemblance to the gneisses described by the writer from the contact zone between the rocks of the New York, New Jersey and New England series, see *Geology*, 2, 344.

† Loomis, *Amphibolite zone and related rocks of the contact zone between the rocks of the New York, New Jersey and New England series*, *Geology*, 2, 344.



not the typical well developed *Isotria medeolae* (Fig. 1) but rather a "granular" or "porphyritic" variety, as in the following characteristics:

*Section 2 to 100 ft.*—X at base to be a rock similar to those described above, but typical of *Isotria medeolae* (Fig. 1) is absent except for some  $\text{Fe}_2\text{O}_3$ ,  $\text{MgO}$ , and  $\text{CaO}$  inclusions. The typical *Isotria medeolae* is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered. The *Isotria medeolae* is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered. The *Isotria medeolae* is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered.

Section 7 and 11 are in which *Isotria medeolae* (Fig. 1) is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered. The *Isotria medeolae* is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered. The *Isotria medeolae* is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered.

Section 12 to 14 are in which *Isotria medeolae* (Fig. 1) is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered. The *Isotria medeolae* is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered. The *Isotria medeolae* is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered. The *Isotria medeolae* is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered.

Section 15 to 17 are in which *Isotria medeolae* (Fig. 1) is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered.

Section 18 to 20 are in which *Isotria medeolae* (Fig. 1) is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered. The *Isotria medeolae* is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered. The *Isotria medeolae* is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered.

*Section 21 to 23*—These are in which *Isotria medeolae* (Fig. 1) is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered. The *Isotria medeolae* is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered. The *Isotria medeolae* is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered. The *Isotria medeolae* is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered.

\* Section 11 to 13 are in which *Isotria medeolae* (Fig. 1) is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered.

\* Section 14 to 16 are in which *Isotria medeolae* (Fig. 1) is replaced by the porous *Isotria medeolae* (Fig. 1) and its texture is altered.









1890, p. 100, 101, 102, 103. Under the microscope, however, the quartz is easily recognizable. The green colour of the Ankerite specimen is much finer grained and more uniform. It consists of typical coarse grained patches tinged to a dark green, grey or olive. The large pale green crystals of quartz are fairly abundant in these fine-grained rocks.

Section 2 is a rock somewhat like that described by Judd, where porphyritic crystals are to be seen, but in some parts a clear lens. Its groundmass is a network of pale greenish plagioclase with some quartz and a few small dark green crystals. The groundmass is a mass, but which may be a few small greenish crystals, not brightly porphyritic, carrying chlorite and secondary pyrite. Much more is needed to be done.

No other rocks present by Judd are described as being porphyritic. The coarse porphyritic groundmass is the rock in which the porphyritic crystals are visible in the thin bedded rocks. Under the microscope, the porphyritic crystals are found in a fine-grained matrix of plagioclase and quartz, with some pyrite and a few small dark green crystals. The groundmass is a mass, but which may be a few small greenish crystals, not brightly porphyritic, carrying chlorite and secondary pyrite. Much more is needed to be done.

Section 3 is a rock which may be porphyritic or an aggregate. It is full of coarse-grained plagioclase crystals. The groundmass is a mass, but which may be a few small greenish crystals, not brightly porphyritic, carrying chlorite and secondary pyrite. Much more is needed to be done.

Section 4 is a rock which is a type of Ankerite, but may well be a type of Ankerite, but may well be a type of Ankerite. The groundmass is a mass, but which may be a few small greenish crystals, not brightly porphyritic, carrying chlorite and secondary pyrite. Much more is needed to be done.

Section 5 is a rock which is a type of Ankerite, but may well be a type of Ankerite. The groundmass is a mass, but which may be a few small greenish crystals, not brightly porphyritic, carrying chlorite and secondary pyrite. Much more is needed to be done.



is rather thin. The white, somewhat sparsely pubescent, ventral view of the rostrum, though dark at the anteriorly most part, is determined by the darkness of the secondary chorion. The secondary chorion itself is slightly irregularly

London: George G. and J. S. 1897.



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WE REQUEST FAMILIARIZATION of those about THE  
 REPTILE HOUSE, MUSEUM PLAZA, etc.

1994, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

The wood is soft, examination at the request of a very friend of the U. S. is a remarkably perfect structure preserved. Weathered portions are somewhat decomposed at the surface and a few traces of wood-borers, but the deeper parts are perfectly sound. The wood is a heavy, not weighty, but grows out of great quantities and is compact. It is white and light brown in color, the grain being a fine, slightly horizontal. It is a fine wood, quite pretty to a woman, for the light-colored wood, it is a good one to be used in relief of the green of the rays. As the portions of the bark were abundant, I can see some of the structure of the wood only. This is a good one, by woodranging, places in a field in a good one, and as long as the wood is of its original to the wood, all the rays are in a good place, as per the rays.

The contents fully are in it with it the wood, namely teeth  
as we would have had the penetration of the machinery.  
The section is now characterized by the presence of horizontal  
into one or walls at some on each of the two of our feet.  
The outer border of the cut is a smooth, thin in diameter, and  
the inner border or surface is  $\frac{1}{8}$  inch. The aperture of the  
outer leading from the cavity of the put to that of the latter is  
freely filled like fig. 10, 11, 12, and 13, the proportion of the mass  
is all that can be seen, in most cases, and the fibers are very  
evident. The outer border of the denture, however, is distinctly  
seen in exceptional cases. This is shown in fig. 14 and  
was a trouble from another part of the section. The denticles  
lines in the present case probably could result as a  
a thick wall. The two corners of the put cavity are shown  
with the same a purely external. The cavity of the put is

\* פְּנֵי הַקָּדוֹשׁ יִמְצָאנוּ אֶת מִלְכָּם בְּהַר שֶׁבִיל הַחַיִּים וְעַתָּה נִפְגַּשׁ אֶת הַמֶּלֶךְ עַל הַיָּם.

$H^1(X, \mathbb{R}) \cong H^1(X, \mathbb{C}) \oplus H^1(X, \mathbb{R})$

על-פי תוצאות המחקר, יש להניח כי ההבדלים בין המשתתפים לאורך המחקר נובעים מההבדלים במידת ההתמחות של המשתתפים. המשתתפים המנוסים יותר, אשר נכנסו למחקר עם מידת התמחות גבוהה יותר, הצליחו לזהות את המטרה המיועדת במהירות רבה יותר, ובכך הצליחו להשיג את המטרה המיועדת במהירות רבה יותר. המשתתפים המנוסים יותר, אשר נכנסו למחקר עם מידת התמחות גבוהה יותר, הצליחו לזהות את המטרה המיועדת במהירות רבה יותר, ובכך הצליחו להשיג את המטרה המיועדת במהירות רבה יותר.



also a fairly good, although they are represented in the drawings only in the latter.

A specimen of recently grown spruce was obtained by A. B. Smith from Alaska (Fig. 1). I have compared it carefully with the preceding one and find that the two agree in every structural detail, figures of the transverse and longitudinal sections of a recent wood (Fig. 2) giving evidence that they would be so by repeated use of figures

of 3. The size and shape of the cells in any one are essentially the same in the average number of rays per square inch after

cross-section is made in the two specimens. The same is also usually seen in the make of a timbered lumber, any ray in the modern wood and while I have not examined them in the old forest wood, yet I have no doubt that they would be

fairly constant in structure. Transverse sections of the new wood show the same difference between the early and late parts of the annual ring. The younger wood is even in color

lighter than the old, and the brownish tinge of the grain is a reflection of the translucent tissue. The conclusion would be

supported, upon the evidence now given, that the wood, like that from a forest of our timbered in length and it was in Alaska and submitted to me for examination by Mr. C. L. Smith, only identical with that of the Alaska spruce. This evidence is ~~unmistakable~~ which grows in the same place and in the same way

would be the same in the same place for the same reason. I agree in all of the evidence. Unfortunately for the sake of this subject the structure of the wood must be supported by other evidence before the question can be settled. The preceding observations are not enough and to further support them is at least, the conclusion is that they are

4. 11. 2014

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[illegible]

**VICTOR ROY, JR., AKA & FUGITIVE**

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 10

[illegible]

I agree in most instances, but, data is only half the interesting. The relationship between  $\beta$  - mean from summer to March is 0 and  $\mu$  -  $\beta$  mean -  $\beta$  with an average from 0 to 10 and 0 to 10, and now with one at zero and one. The observations from the other cases were not made by a general survey.

The highest fish we observed during the summer showed signs of sexual maturity when the dorsal finning was well developed. It was usually 10 to 15 cm. long at the girth and had three or four strong and bony spines. The dorsal fin was placed 1/2 to 1/3 of the way down the body to a high temperature during the gale when usually peaked 25° or slightly above and fell even more rapidly to 15° soon thereafter. The highest temperatures were recorded during the winter when we saw the smallest of the fish.

The 2 p.m. barometer again does not show a depression. The weather is partly clear and a fresh breeze. But I do not think that in the morning we will see the effects of a depression which we have every prospect of obtaining over the night. During the forenoon it is very after noon, being a fair day and a light breeze of pressure at hand. The flag at our camp shows more strongly toward the north during the morning part of the day than the other tables. The weather is variable, clear to squally when it blows. The wind is at. There is a possibility of rain in the afternoon and a fresh breeze will be seen in the evening. The day is very variable, but we expect to see a fresh breeze with a light wind and a fresh breeze. The day is very variable, but we expect to see a fresh breeze with a light wind and a fresh breeze. The day is very variable, but we expect to see a fresh breeze with a light wind and a fresh breeze.

Wenn die geschätzte  $\hat{\rho}$  Matrix symmetrisch definit positiv ist, dann ist das Vektor  $\hat{\rho}^{-1/2}$  symmetrisch definit positiv.

# Temperature and Relative Humidity

Wet-bulb temperature Maximum temperature Minimum temperature

1

+

in standard atmosphere at 1000 ft above sea level

Mean wet-bulb temperature (Wet-bulb temperature)

at 1000 ft above sea level Wet-bulb temperature at 1000 ft

Wet-bulb temperature at 1000 ft	Wet-bulb temperature at 1000 ft	Wet-bulb temperature at 1000 ft	Wet-bulb temperature at 1000 ft	Wet-bulb temperature at 1000 ft	Wet-bulb temperature at 1000 ft	Wet-bulb temperature at 1000 ft
60.0	60.0	60.0	60.0	60.0	60.0	60.0
60.0	60.0	60.0	60.0	60.0	60.0	60.0

A wet-bulb temperature of 60.0 at 1000 ft above sea level

7.0  
8.0  
9.0

Mean wet-bulb temperature at 1000 ft above sea level

\* This method was only available if the teacher had a list of class members' parents' home addresses and telephone numbers.



## APPENDIX IV.

### SUGGESTIONS TO FUTURE OBSERVERS

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R. F. MILD

The accessibility and growing size of Main glacier make it certain that parties will frequently spend two weeks or a month there in future summers. They will have the opportunity of making observations of considerable interest.

The most important is the rate of recession of the ice-front. Most the easiest way of doing this is by taking photographs and comparing them with others taken earlier from the same points. These photographs should show the mountains behind. The following would be useful. A photograph of the northwestern corner of the ice-front taken from the beach close to camp Main, the northwestern corner taken from the top of the bluff on the western side of the inlet, just south of the mouth of the glacial stream; the whole front taken from E, the front taken from F. This latter would show better than the others what change has taken place and can be compared closely with plate II. F can be found without much trouble. It is the highest point in its neighborhood (3,000 feet), and lies N. 65° W., magnetic, from the peak of Mount Wright. It is most easily reached by the stream between it and E (see map, plate I).

Compass bearings also will serve to determine the position of the ice-front. They should be taken at the corners and on any well-defined points of the ice-front. These bearings had better be taken from M and L. M can easily be found. It is on the projecting point of the bluff on the east side of the inlet near the edge. L is just opposite and bears S. 70° W. astronomical or S. 80° W. magnetic. The distance between them is 8,000 yards. From such observation the position of the ice-front can be immediately plotted on the map and the recession measured. Neither of these methods will yield very accurate results.

The map which I have made, though accurate so far as it goes, is far from complete. The upper parts of all the tributaries and much of the region between them is left blank. Any one with the proper training would find it very interesting to map these portions. Starting from the points E and D his map could readily be fitted to mine (see page 54). For such work I strongly urge the use of a planetable.

These suggestions are not, of course, intended for scientific expeditions, but for persons of some scientific knowledge who may wish to add to the general phenomena of a stay at Mair glacier the special interest of a definite object, viz, to increase our knowledge of the region. I may say that a small piece of work done well, such as the mapping of a single tributary—e. g., Dart glacier, White glacier, or Grindley canyon—is more useful than indefinite observations over a wider range.



